

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently amended) A method of internally cleaning a coil pipe of a heat exchanger, said heat exchanger including an outlet and an inlet providing fluid communication with said coil pipe, said method comprising:

(1) flushing said coil pipe in a first flow direction by:

connecting a first end of a suction hose to said heat exchanger inlet;

connecting a second end of said suction hose to a suction pump and a waste-and-wash water collecting tank; and

connecting one end of an ice-feeding hose to said heat exchanger outlet and a second end of said ice-feeding hose to a hopper;

supplying an ice and water mixture into said hopper;

engaging said suction pump to create a suction effective so that the ice and water are suctioned into said coil pipe outlet, pass internally through said coil pipe in a reverse flow direction towards said inlet, exit said inlet, and collect in said waste-and-wash water collecting tank, wherein a negative pressure created by said suction does not exceed a value equal in magnitude to ambient atmospheric pressure;

(2) flushing said coil pipe in a second flow direction by:

connecting said first end of said suction hose to said heat exchanger outlet;

connecting said second end of said suction hose to said suction pump and said waste-and-wash water collecting tank; and

connecting said one end of said ice-feeding hose to said heat exchanger inlet and said second end of said ice-feeding hose to said hopper;

supplying said ice and water mixture into said hopper;

engaging said suction pump to create the suction effective so that the ice and water are suctioned into said coil pipe inlet, pass internally through said coil pipe in a normal flow direction towards said outlet, exit said outlet, and collect in said waste-and-wash water collecting tank, wherein the negative pressure created by said suction does not exceed the value equal in magnitude to said ambient atmospheric pressure; and

(3) alternately flushing said coil pipe in said first and second flow directions for cleaning said coil pipe.

2-5. (Canceled)

6. (Currently amended) A method of internally cleaning a copper coil pipe of a heat exchanger, said heat exchanger including an outlet and an inlet providing fluid communication with said coil pipe, said method comprising:

(1) flushing said coil pipe in a first flow direction by:

connecting a first end of a suction hose to said heat exchanger inlet;
providing a carriage and disposing a suction pump and a waste-and-wash water collector tank on said carriage;

connecting a second end of said suction hose to said suction pump and said waste-and-wash water collecting tank; and

connecting one end of an ice-feeding hose to said heat exchanger outlet and a second end of said ice-feeding hose to a hopper;

supplying an ice and water mixture into said hopper;

engaging said suction pump to create a suction effective so that the ice and water are suctioned into said coil pipe outlet, pass internally through said coil pipe in a reverse flow direction towards said inlet, exit said inlet, and collect in said waste-and-wash water collecting tank, wherein a negative pressure created by said suction does not exceed a value equal in magnitude to ambient atmospheric pressure;

(2) flushing said coil pipe in a second flow direction by:

connecting said first end of said suction hose to said heat exchanger outlet;

connecting said second end of said suction hose to said suction pump and said waste-and-wash water collecting tank; and

connecting said one end of said ice-feeding hose to said heat exchanger inlet and said second end of said ice-feeding hose to said hopper; supplying said ice and water mixture into said hopper; engaging said suction pump to create the suction effective so that the ice and water are suctioned into said coil pipe inlet, pass internally through said coil pipe in said a normal flow direction towards said outlet, exit said outlet, and collect in said waste-and-wash water collecting tank, wherein the negative pressure created by said suction does not exceed the value equal in magnitude to said ambient atmospheric pressure; and

(3) alternately flushing said coil pipe in said first and second flow directions; whereby impact energy of said ice cubes and force from said water through said coil pipe and suction hose into said waste-and-wash water collecting tank clean said coil pipe.

7. (Previously Presented) The method according to claim 1, further comprising providing a transparent portion in said ice feeding hose for enabling visual inspection of the flow of waste-and-wash water therethrough.

8. (Previously Presented) The method according to claim 6, further comprising providing a transparent portion in said ice feeding hose for enabling visual inspection of the flow of waste-and-wash water therethrough.

9. (Previously Presented) The method according to claim 1, wherein the ice and water are mixed in a ratio of 1 (ice) to 4~6 (water).

10. (Previously Presented) The method according to claim 6, wherein the ice and water are mixed in a ratio of 1 (ice) to 4~6 (water).

11. (Previously Presented) The method according to claim 1, wherein the ice is prepared in a form of a cube having a side length of about $1/3$ - $2/3$ of an inside diameter of said heat exchanger coil pipe.

12. (Previously Presented) The method according to claim 6, wherein the ice is prepared in a form of a cube having a side length of about $1/3$ - $2/3$ of an inside diameter of said heat exchanger coil pipe.

13. (Currently amended) A method of internally cleaning a heat exchanger having at least two coil pipes interconnecting a first header and a second header, said method comprising:

connecting a hopper containing an ice and water mixture to a one of said first header or said second header; and

applying suction to a remaining one of said first header or said second header to cause ~~causing~~ said ice and water mixture to be suctioned into said one of said first

header or said second header and to simultaneously pass internally through said at least two coil pipes, wherein a negative pressure created by said suction does not exceed a value equal in magnitude to ambient atmospheric pressure ~~by applying suction to a remaining one of said first header or said second header.~~

14. (Previously Presented) The method according to claim 13, wherein said one of said first header or said second header is an inlet header, and said remaining one of said first header or said second header is an outlet header.

15. (Previously Presented) The method according to claim 14, further comprising repeating said method wherein said one of said first header or said second header is said outlet header and said remaining one of said first header or said second header is said inlet header.

16. (Previously Presented) The method according to claim 15, further comprising repeating said method wherein said one of said first header or said second header alternates between being one of said inlet header or said outlet header and said remaining one of said first header or said second header alternates between being a respective remaining one of said inlet header or said outlet header.

17. (Previously Presented) The method according to claim 15, wherein said coil pipes are non-corrugated.

18. (Currently amended) A method of internally cleaning a coil pipe of a heat exchanger, said heat exchanger including an outlet and an inlet providing fluid communication with said coil pipe, said method comprising:

connecting a hopper containing an ice and water mixture to a one of said inlet or said outlet; and

applying suction to a remaining one of said inlet or said outlet so that the ice and water mixture is suctioned from said hopper into said one of said inlet or said outlet and caused to flow internally through said coil pipe towards said remaining one of said inlet or outlet, wherein a negative pressure created by said suction does not exceed a value equal in magnitude to ambient atmospheric pressure.

19. (Previously Presented) The method according to claim 18, further comprising monitoring a degree of dirt contained in said ice and water mixture flowing internally through said coil pipe by visually observing the ice and water mixture exiting from said remaining one of said inlet or said outlet said coil pipe through a transparent portion of a suction hose communicative therewith and which provides said suction to said remaining one of said inlet or said outlet.

20. (Previously Presented) The method according to claim 18, wherein the ice and water mixture comprises an ice:water ratio of 1 (ice) to 4~6 (water).

21. (Previously Presented) The method according to claim 18, wherein the ice comprising said ice and water mixture is prepared as cubes, each generally having a side length of about $\frac{1}{3}$ - $\frac{2}{3}$ of an inside diameter of said coil pipe.

22. (Previously Presented) The method according to claim 18, wherein:
said connecting the hopper containing an ice and water mixture to a one of said inlet or said outlet includes connecting an ice and water feeding hose to said one of said inlet or said outlet; and

said applying suction to said remaining one of said inlet or said outlet includes providing a carriage on which a suction pump for applying said suction via a suction hose and a waste-and-wash water collecting tank for collecting said ice and water mixture exiting from said remaining one of said inlet or said outlet are mounted.

23. (Cancelled)

24. (Previously Presented) The method according to claim 18, wherein said one of said inlet or said outlet to which said hopper is connected is said inlet, and said remaining one of said inlet or said outlet to which said suction is applied is said outlet.

25. (Previously Presented) The method according to claim 24, further comprising repeating said method wherein said one of said inlet or said outlet to which said hopper is connected is said outlet and said remaining one of said inlet or said outlet to which said suction is applied is said inlet.

26. (Previously Presented) The method according to claim 25, further comprising repeating said method wherein said one of said inlet or said outlet to which said hopper is connected alternates between being said inlet or said outlet and said remaining one of said inlet or said outlet to which said suction is applied alternates between being a respective remaining one of said inlet or said outlet.

27. (Previously Presented) The method according to claim 25, wherein said coil pipes are non-corrugated.